

CLAIMS

1. A display component, for decoding and displaying data coded using a transform having basis functions; comprising:
- 5 a plurality of pixels (6) arranged as a block (4);
each pixel (6) including:
a summing element (26);
an first element (22) providing a unit positive contribution to the summing element ;
- 10 a first switch (24) connecting the first element to the summing element;
a second element (32) providing a unit negative contribution to the summing element;
a second switch (34) connecting the second element to the summing element;
- 15 control circuitry (40) connected to the first and second switches (24, 34) for switching the first and second switches in accordance with basis function values;
- the display component further comprising a modulator (62, 94) for modulating all the first and second elements of the pixels of a block (4) in common in accordance with input data, so that the summing element (26)
- 20 accumulates decoded input data for display in accordance with the input data and the basis function values.
2. A display component according to claim 1, wherein:
- 25 the summing element (26) is a capacitance, the voltage on the capacitance determining the pixel output;
- the first element (22) is a modulated current source for charging the capacitance, and
- the second element (32) is a modulated current sink for discharging the
- 30 capacitance.

3. A display component according to claim 2 wherein the current source (22) is a photodiode (60) connected between a high voltage rail (28) and the capacitance (26), the current sink (32) is a photodiode (60) connected between a low voltage rail (38) and the capacitance (26), and the modulator (62) includes a light emitting element arranged to transmit an optical signal to the photodiodes (60) of the block to modulate the photodiodes (60).

4. A display component according to claim 2 wherein the current sources and sinks are transistors (72) having control terminals (74) connected through common data lines (96) to the modulator (94).

5. A display component according to any preceding claim comprising:
a plurality of the blocks (4) are arranged in rows (14) and columns (12),
each row (14) of blocks having a block select line (66) for selecting that row of blocks;
wherein the pixel elements (6) of each row (14) of blocks (4) only operate to decode data when selected by the block select line (66).

6. A display component according to claim 5 wherein the pixels comprise a block select switch (82) connected between the summing element (26) and the first and second switches (24, 34), the control input of the block select switch (82) being connected to the block select line (66).

7. A display component according to any preceding claim wherein:
the control circuitry of each pixel has row (42) and column (44) basis function inputs;
further comprising:
row basis function lines (102) connected to the row basis function input (44) of each pixel element of a row of pixel elements of a block; and

column basis function lines (106) connected to the column basis function input (42) of each pixel element of a column of pixel elements of a block; and

5 wherein the at least one basis function generator (18) generates basis functions for each row and column and outputs the basis functions on respective outputs (100, 104) connected to respective row and column basis function lines (102, 106).

8. A display component according to claim 7 wherein the control
10 circuitry (40) has an XOR gate (46) having the XOR gate inputs connected to the row and column basis function inputs (42, 44) and the XOR gate output connected to one of the first and second switches (24, 34) directly and the other of the first and second switches (24, 34) through an inverter (48).

15 9. A display component according to any preceding claim wherein the basis functions are Walsh basis functions.

10. A liquid crystal display, comprising an active plate (2) in the form
of a display component according to any preceding claim, a passive plate (50),
20 and liquid crystal (52) between the active and passive plates.

11. A display component according to any of claims 1 to 9 wherein
each pixel element further includes a polymer light emitting diode (92) for
emitting light in accordance with the decoded input data on the summing
25 element.

12. A method of driving a display having a plurality of a plurality of
pixels (6) arranged as a block (4), each pixel (6) including a summing element
(26) a first element (22) providing a unit positive contribution to the summing
30 element; a second element (32) providing a unit negative contribution to the
summing element; and switches (24, 34) connecting the first and second
elements to the summing element, the method including:

accepting an input data stream (30) for the block including a plurality of sequential data items coded using a transform having basis functions;

modulating the first and second elements (22, 32) in common for all pixels of the block in accordance with the input data stream;

- 5 switching the switches (24, 34) in each pixel (6) between a state in which the first and second elements (22, 32) are connected to the summing element (26) to add to or subtract from the data accumulated on the summing element and a state in which the first and second element are not connected, the switching taking place sequentially in accordance with a sequence of basis
- 10 function values for each pixel of the block determined by the location of each pixel within the block; and
- displaying a visual output for each pixel in accordance with the data accumulated on the summing element (26).